1. A method of enhancing intelligibility of speech contained in an audio signal perceived by a subject via a communications path, where the communications path includes a intelligibility enhancing device having an adjustable gain, comprising

generating a candidate frequency-wise gain which, if applied to the intelligibility enhancing device, would maximize an intelligibility metric of the communications path, where the intelligibility metric is a function of the relation:

$$AI = V \times E \times F \times H$$

where,

AI is the intelligibility metric,

V is a measure of audibility of the speech contained in the audio signal and is associated with a speech-to-noise ratio in the audio signal,

E is a loudness limit associated the speech contained in the audio signal,

F is a measure of spectral balance of the speech contained in the audio signal,

H is a measure of any of (i) intermodulation distortion introduced by an ear of the subject, (ii) reverberation in the medium, (iii) frequency-compression in the communications path, (iv) frequency-shifting in the communications path and (v) peak-clipping in the communications path, (vi) amplitude compression in the communications path, (vii) any other noise or distortion in the communications path not otherwise associated with V, E and F.

2. The method of claim 1, comprising adjusting the gain of the intelligibility enhancing device in accord with the candidate frequency-wise gain.

3. The method of claim 1, wherein the generating step includes generating a current candidate frequency-wise gain as a function of a broadband gain adjustment of a prior candidate frequency-wise gain.

4. The method of claim 3, wherein the generating step includes performing one or more frequency-wise gain adjustments on the current candidate frequency-wise gain.

5. The method of claim 4, comprising generating a candidate frequency-wise gain that mirrors an attenuation-modeled component of an audiogram for said subject, in order to bring a sum of that candidate frequency-wise gain and that attenuation-modeled component toward zero.

6. The method of claim 5, wherein the performing step includes a noise-minimizing frequency-wise gain adjustment step comprising adjusting the current candidate frequency-wise gain to compensate for a noise spectrum associated with the communications path.

7. The method of claim 6, wherein the performing step includes a noise-minimizing frequency-wise gain adjustment step comprising adjusting the current candidate frequency-wise gain to compensate for a noise spectrum associated with the communications path, specifically, such that adjustment of the gain of the intelligibility enhancing device in accord with that candidate frequency-wise gain would bring that spectrum to audiogram thresholds.

8. The method of claim 7, wherein the performing step includes re-adjusting the current candidate frequency-wise gain to remove at least some of the adjustments made in noise-minimizing frequency-wise gain adjustment step.

9. The method of claim 8, comprising selecting as a current candidate frequency-wise gain any of a re-adjusted candidate frequency-wise gain and one or more prior candidate frequency-wise gains, where such selection is a function of which of such gains is associated with the highest intelligibility metric.

10. The method of claim 3, wherein the generating step includes generating the current candidate frequency-wise gain without substantially exceeding the loudness limit, E.

11. The method of claim 3, comprising selecting as a current candidate frequency-wise gain any of a current candidate frequency-wise gain and one or more prior candidate frequency-wise gains, where such selection is a function of which of such gains is associated the highest intelligibility metric.

12. The method of claim 3, comprising selecting as a current candidate frequency-wise gain any of a current candidate frequency-wise gain and a zero gain, where such selection is a function of which of such gains is associated the highest intelligibility metric.

13. The method of claim 1, comprising executing the performing step multiple times and choosing the candidate frequency-wise gain resulting from such execution associated with the highest intelligibility metric.

14. The method of claim 1, wherein the intelligibility enhancing device is any of a hearing aid, loudspeaker, assistive listening device, telephone, personal music delivery systems, public-address system, speech delivery system, speech generating system.

15. The method of claim 1, comprising generating a candidate frequency-wise gain that mirrors an attenuation-modeled component of an audiogram for said subject, in order to bring a sum of that candidate frequency-wise gain and that attenuation-modeled component toward zero.

16. A method of enhancing intelligibility of speech contained in an audio signal perceived by a subject via a communications path, where the communications path includes a intelligibility enhancing device having an adjustable gain, comprising:

A. generating a candidate frequency-wise gain that mirrors an attenuation-modeled component of an audiogram for said subject, in order to bring a sum of that candidate frequency-wise gain and that attenuation-modeled component toward zero.

B. adjusting the broadband gain of the candidate frequency-wise gain so that, if applied to the intelligibility enhancing device, would maximize an intelligibility metric of the communications path without substantially exceeding a loudness limit, E, for said subject, where the intelligibility metric is a function of the relation:

$$AI = V \times E \times F \times H$$

where,

AI is the intelligibility metric,

V is a measure of audibility of the speech contained in the audio signal and is associated with a speech-to-noise ratio in the audio signal,

E is a loudness limit associated the speech contained in the audio signal,

F is a measure of spectral balance of the speech contained in the audio signal,

H is a measure of any of (i) intermodulation distortion introduced by an ear of the subject, (ii) reverberation in the medium, (iii) frequency-compression in the communications path, (iv) frequency-shifting in the communications path and (v) peak-clipping in the communications path, (vi) amplitude compression in the communications path, (vii) any other noise or distortion in the communications path not otherwise associated with V, E and F,

C. adjusting the frequency-wise gain to compensate for a noise spectrum associated with the communications path, specifically, such that adjustment of the gain of the intelligibility enhancing device in accord with that candidate frequency-wise gain would bring that spectrum to audiogram thresholds,

D. adjusting the broadband gain of the candidate frequency-wise gain so that, if applied to the intelligibility enhancing device, would maximize an intelligibility metric of the communications path without substantially exceeding a loudness limit, E, for said subject,

E. testing whether adjusting the candidate frequency-wise gain to remove at least some of the adjustments made in step (C) would increase the intelligibility metric of the communications path and, if so, adjusting the candidate frequency-wise gain,

F. adjusting the broadband gain of the candidate frequency-wise gain so that, if applied to the intelligibility enhancing device, would maximize an intelligibility metric of the communications path without substantially exceeding a loudness limit, E, for said subject,

G. choosing the candidate frequency-wise gain characteristic resulting from steps (B), (D) and (F) associated the highest intelligibility metric,

H. choosing between a zero gain and the candidate frequency-wise gain chosen in step (G), depending on which of such gains is associated the highest intelligibility metric, and

I. adjusting the gain of the hearing compensation device in accord with the candidate frequency-wise gain characteristic chosen in step (H).

17. A method of enhancing intelligibility of speech contained in an audio signal perceived by a subject via a communications path, where the communications path includes a intelligibility enhancing device, the method comprising

applying to the intelligibility enhancing device a frequency-wise gain (hereinafter, "applied frequency-wise gain") made by a process that maximizes an intelligibility metric of the communications path, where the intelligibility metric is a function of the relation:

$$AI = V \times E \times F \times H$$

where,

AI is the intelligibility metric,

V is a measure of audibility of the speech contained in the audio signal and is associated with a speech-to-noise ratio in the audio signal,

E is a loudness limit associated the speech contained in the audio signal,

F is a measure of spectral balance of the speech contained in the audio signal,

H is a measure of any of (i) intermodulation distortion introduced by an ear of the subject, (ii) reverberation in the medium, (iii) frequency-compression in the communications path, (iv) frequency-shifting in the communications path and (v) peak-clipping in the communications path, (vi) amplitude compression in the communications path, (vii) any other noise or distortion in the communications path not otherwise associated with V, E and F.

18. The method of claim 17, wherein the process includes generating a current candidate frequency-wise gain as a function of a broadband gain adjustment of a prior candidate frequency-wise gain.

19. The method of claim 18, wherein the process includes performing one or more frequency-wise gain adjustments on a prior candidate frequency-wise gain.

20. The method of claim 19, wherein the process includes generating a candidate frequency-wise gain that mirrors an attenuation-modeled component of an audiogram for said subject, in order to bring a sum of that candidate frequency-wise gain and that attenuation-modeled component toward zero.

21. The method of claim 20, wherein the performing step includes a noise-minimizing frequency-wise gain adjustment step comprising adjusting the current candidate frequency-wise gain to compensate for a noise spectrum associated with the communications path.

22. The method of claim 21, wherein the performing step includes a noise-minimizing frequency-wise gain adjustment step comprising adjusting the current candidate frequency-wise gain to compensate for a noise spectrum associated with the communications path, specifically, such that adjustment of the gain of the intelligibility enhancing device in accord with that candidate frequency-wise gain would bring that spectrum to audiogram thresholds.

23. The method of claim 22, wherein the performing step includes re-adjusting the current candidate frequency-wise gain to remove at least some of the adjustments made in noise-minimizing frequency-wise gain adjustment step.

24. The method of claim 23, wherein the performing step includes selecting as a current candidate frequency-wise gain any of a re-adjusted candidate frequency-wise gain and one or more prior candidate frequency-wise gains, where such selection is a function of which of such gains is associated with the highest intelligibility metric.

25. The method of claim 19, wherein the process includes generating a current candidate frequency-wise gain without substantially exceeding the loudness limit, E.

26. The method of claim 19, wherein the process includes selecting as a current candidate frequency-wise gain any of a current candidate frequency-wise gain and one or more prior candidate frequency-wise gains, where such selection is a function of which of such gains is associated the highest intelligibility metric.

27. The method of claim 19, wherein the process includes selecting as a current candidate frequency-wise gain any of a current candidate frequency-wise gain and a zero gain, where such selection is a function of which of such gains is associated the highest intelligibility metric.

28. The method of claim 19, wherein the process includes executing the performing step multiple times and choosing the candidate frequency-wise gain resulting from such execution associated with the highest intelligibility metric.

29. The method of claim 17, wherein the process includes generating a candidate frequency-wise gain that mirrors an attenuation-modeled component of an audiogram for said subject, such that a sum of that candidate frequency-wise gain and that attenuation-modeled component is substantially zero.

30. In a device for enhancing intelligibility of speech contained in an audio signal perceived by a subject via a communications path that includes the device, the improvement wherein the device applies to the audio signal a frequency-wise gain (hereinafter, "applied frequency-wise gain") made by a process that maximizes an intelligibility metric of the communications path, where the intelligibility metric is a function of the relation:

$$AI = V \times E \times F \times H$$

where,

AI is the intelligibility metric,

V is a measure of audibility of the speech contained in the audio signal and is associated with a speech-to-noise ratio in the audio signal,

E is a loudness limit associated the speech contained in the audio signal,

F is a measure of spectral balance of the speech contained in the audio signal,

H is a measure of any of (i) intermodulation distortion introduced by an ear of the subject, (ii) reverberation in the medium, (iii) frequency-compression in the communications path, (iv) frequency-shifting in the communications path and (v) peak-clipping in the communications path, (vi) amplitude compression in the communications path, (vii) any other noise or distortion in the communications path not otherwise associated with V, E and F.

31. In the device of claim 30, the further improvement wherein the process includes generating a current candidate frequency-wise gain as a function of a broadband gain adjustment of a prior candidate frequency-wise gain.

32. In the device of claim 31, the further improvement wherein the process includes performing one or more frequency-wise gain adjustments on a prior candidate frequency-wise gain.

33. In the device of claim 31, the further improvement wherein the process includes generating a candidate frequency-wise gain that mirrors an attenuation-modeled component of an audiogram for said subject, in order to bring a sum of that candidate frequency-wise gain and that attenuation-modeled component toward zero.

34. In the device of claim 31, the further improvement wherein the process includes a noise-minimizing frequency-wise gain adjustment step comprising adjusting the current candidate frequency-wise gain to compensate for a noise spectrum associated with the communications path.

35. A method of enhancing intelligibility of sound contained in an audio signal perceived by a subject via a communications path, where the communications path includes a intelligibility enhancing device having an adjustable gain, comprising

generating a candidate frequency-wise gain which, if applied to the intelligibility enhancing device, would maximize an intelligibility metric of the communications path, where the intelligibility metric is a function of the relation:

$$AI = V \times E \times F \times H$$

where,

AI is the intelligibility metric,

V is a measure of audibility of the sound contained in the audio signal and is associated with a sound-to-noise ratio in the audio signal,

E is a loudness limit associated the sound contained in the audio signal,

F is a measure of spectral balance of the sound contained in the audio signal,

H is a measure of any of (i) intermodulation distortion introduced by an ear of the subject, (ii) reverberation in the medium, (iii) frequency-compression in the communications path, (iv) frequency-shifting in the communications path and

(v) peak-clipping in the communications path, (vi) amplitude compression in the communications path, (vii) any other noise or distortion in the communications path not otherwise associated with V, E and F.

36. In a device for enhancing intelligibility of sound contained in an audio signal perceived by a subject via a communications path that includes the device, the improvement wherein the device applies to the audio signal a frequency-wise gain (hereinafter, "applied frequency-wise gain") made by a process that maximizes an intelligibility metric of the communications path, where the intelligibility metric is a function of the relation:

$$AI = V \times E \times F \times H$$

where,

AI is the intelligibility metric,

V is a measure of audibility of the sound contained in the audio signal and is associated with a sound-to-noise ratio in the audio signal,

E is a loudness limit associated the sound contained in the audio signal,

F is a measure of spectral balance of the sound contained in the audio signal,

H is a measure of any of (i) intermodulation distortion introduced by an ear of the subject, (ii) reverberation in the medium, (iii) frequency-compression in the communications path, (iv) frequency-shifting in the communications path and (v) peak-clipping in the communications path, (vi) amplitude compression in the communications path, (vii) any other noise or distortion in the communications path not otherwise associated with V, E and F.